

California Regional Water Quality Control Board
Santa Ana Region

January 19, 2001

ITEM: 22

SUBJECT: Draft Supplemental Guidance for the Prioritization of Investigation and Cleanup of Underground Storage Tank Releases Containing MtBE

DISCUSSION:

Recent drinking water well sampling in Orange County and elsewhere in Southern California has demonstrated that drinking water systems are occasionally affected by chemicals from petroleum releases from underground storage tanks (USTs), these releases can threaten the long-term beneficial uses of the groundwater. Specifically, the introduction of the fuel oxygenate methyl *tert* butyl ether (MtBE) has increased the threat from gasoline releases from USTs.

In January 26, 1996, the Santa Ana Regional Water Quality Control Board issued local guidance regarding the use of risk-based strategies in the regulation of leaking underground fuel tanks, which included the stipulation that “the presence of MtBE ... would not allow for the designation of a site as ‘low-risk’”. Since that time, the growing awareness of the presence of significant levels of MtBE in the groundwater beneath the majority of USTs in our Region and the associated threat to our groundwater resources and municipal supply wells have prompted Board staff to draft additional guidance.

This draft guidance document is intended to assist managers and staff at state and local regulatory agencies in the Santa Ana Region with the task of overseeing the investigation and cleanup of UST sites where there have been releases of MtBE-laden gasoline. This document has been drafted to supplement the site classification in the Final Draft Guidelines for the Investigation and Cleanup of MtBE and Other Ether-Based Oxygenates, dated March 27, 2000, from the State Water Resources Control Board.

The supplemental guidance document presents a site priority classification that considers a site’s contaminant concentration and other factors to identify those sites most likely to cause impacts to sensitive groundwater resources. It then specifies, for each priority classification, the site characterization activities and remedial objectives that should be completed within specified time periods, and the conditions that need to be satisfied for a particular site classification to successfully proceed to closure. Sites that are situated close to active water supply wells are given the highest priority for cleanup.

Staff is providing this initial draft document to the Board for informational purposes at this time. It will also be distributed to interested parties for review and comment. Staff will schedule a workshop on the guidance for the April 19, 2001, Board meeting, and will present a final draft document to the Board at that time.

**California Regional Water Quality Control Board
Santa Ana Region**

**Draft Supplemental Guidance for
Prioritization of Investigation and Cleanup of Underground Storage
Tank Releases Containing MtBE**

Introduction

Local agencies implementing the Underground Storage Tank (UST) Program and other interested parties have requested guidance for the prioritization of gasoline release cases containing methyl *tert*-butyl ether (MtBE) in the Santa Ana Region. This guidance document is intended to assist managers and staff at state and local regulatory agencies in the Santa Ana Region with the task of overseeing the investigation and cleanup of sites where there have been releases of MtBE-laden gasoline. This document is intended to supplement the site classification in the Final Draft Guidelines for the Investigation and Cleanup of MtBE and Other Ether-Based Oxygenates, dated March 27, 2000, from the State Water Resources Control Board.

The purpose of this guidance document is to describe a standardized and effective approach for dealing with petroleum releases containing fuel oxygenates, such as MtBE. Unlike traditional petroleum constituents, MtBE moves quickly and is slow to degrade in the subsurface environment. In order to avoid costly impacts to municipal supply wells and valued aquifers, a quick response to the release is critical in order to check the spread of the contaminants both horizontally and vertically. Regulators will need to prioritize their cases and give greatest oversight to those sites that pose the greatest risk to the groundwater.

Background

California's Underground Storage Tank (UST) Program, in existence since 1984, was established to address the large number of UST releases. These sites, where generally unknown quantities of gasoline were released into the underlying soils and groundwater, were threatening drinking water supplies.

The addition of a group of fuel additives called oxygenates, such as MtBE, to gasoline supplies throughout the state at various times over approximately the last fifteen years has increased the potential for long-term drinking water impairment. The threat from MtBE to the drinking water resources of a community reliant on groundwater is much greater than that from other petroleum compounds. The finding of significant levels of MtBE in the soils and groundwater beneath the majority of gasoline stations in the Santa Ana Region prompts a heightened level of concern for our groundwater resources.

In order to ensure that remediation begins quickly at sites with significant levels of MtBE (or benzene, when appropriate), this guidance document incorporates recommended time frames for the completion of plume characterization activities and the actual start-up of remedial actions. Application of these time frames to individual cases will require the consideration of site-specific extenuating circumstances, such as property access issues.

Classification of Sites by Threat

Gasoline release sites may create a variety of threats to the environment. These guidelines, however, prioritize sites based solely on threats to groundwater resources. Regulators may need to modify a site's priority based on other environmental threats.

Within the Santa Ana Region all groundwater subbasins are designated as drinking water sources and all releases that affect groundwater should be considered threats to drinking water supplies. Therefore, these guidelines do not prioritize sites based solely on the distance of the site from existing drinking water supply wells. However, if a UST site is situated relatively close to an active drinking water supply well, the potential threat the site could pose would be increased.

Thus, the threat to the groundwater resources' long-term beneficial uses from a particular UST release site is significantly influenced by the mass of contaminant released. The highest observed concentrations of MtBE in groundwater at the site and the persistence of such levels can be utilized as a data surrogate for actual contaminant mass released. Additionally, elevated priority must be given to UST sites with severe MtBE contamination that are also close to active drinking water wells.

Classifications

The following classifications have been generally developed based on the criteria discussed above. Priority for case oversight and remedial action will be in order from Class I to Class IV. The appropriate degree and pace of the remedial response for the different classes are addressed in the following text.

Groundwater Cases

Site Conditions	Class
Free Product (Gasoline)	Class I
>50,000 ppb MtBE, & less than 2000 feet from an active drinking water well	Class I
>50,000 ppb MtBE, & greater than 2000 feet from an active drinking water well	Class II
500 to 50,000 ppb MtBE	Class II
Less than 500 ppb MtBE	Class III

Other Types of Cases

Soils Only Cases	Class IV
Releases not overlying sources of drinking water	Class IV

For sites that involve other types of petroleum hydrocarbons, such as diesel fuel, the appropriate response should be developed through discussion with the overseeing agency.

At this time, the oxygenate being most widely utilized by oil companies and being observed at gasoline release sites is MtBE. Other oxygenates, such as tert-butyl alcohol (TBA), are being observed at a number of sites at significant concentrations. The expected approach to the quantification of compounds other than MtBE is the application of a more exact chemical analysis, EPA Method 8260A, in order to quantify and monitor gasoline release sites for the presence of the various chemicals in gasoline. As more data are gathered regarding the presence of other chemicals of concern, additional guidance may be developed.

The following is a discussion of the descriptions and activities for each of the proposed classifications.

Class I Sites (Highest Priority)

Class I sites are those groundwater cases within 2000 feet of an active drinking water well which have either one of two conditions. These sites have either:

- a maximum MtBE concentration above 50,000 parts per billion, or
- free gasoline product floating on the watertable.

This designation can also be applied to sites in proximity to a drinking water supply well that is affected by gasoline-related contaminants.

The following regulatory actions are appropriate for Class I sites:

1. Require immediate identification and control of the source of the gasoline leakage.
2. Require definition of the lateral extent of the plume within six months.
(Extensions may be granted if access to adjacent properties is necessary.)
(The plume definition activities should extend to the 5 ppb. MtBE contour line.)
3. Require definition of the vertical extent of the plume within twelve months.
(Extensions may be granted if access to adjacent properties is necessary.)
(The plume definition activities should extend to the 5 ppb. MtBE contour line.)
4. Require a survey of all drinking water sources within a one-mile radius during the first three months.
5. Require the submittal of quarterly groundwater monitoring reports.
6. Require timely initiation of the remediation of the core portion of the groundwater plume. This should include the submittal of an Interim Remedial Action Plan within two months and its implementation within three months of its approval.
7. Require the initiation of soil remediation within one year. Soil remediation should continue until soils no longer act as a source of groundwater contamination.
8. Require the remediation of any remaining groundwater contamination (final remediation goals should be based on State Board Resolution No. 92-49).

9. Require the installation of a sentinel well(s) within one year to monitor plume migration. *
10. Report all monitoring and remedial activities on a quarterly basis.

* Regulatory agency staff may waive this item, if appropriate.

Class II Sites

Class II sites are those groundwater cases which have either:

Maximum MtBE concentrations above 50,000 ppb. and are more than 2000 feet from an active groundwater supply well, or maximum MtBE concentrations between 500 and 50,000 ppb.

The following regulatory actions are appropriate for Class II sites:

1. Require immediate identification and control of the source.
2. Require definition of the vertical and lateral extent of the plume within eighteen months. (Extensions may be granted if access to adjacent properties is involved.) (The plume definition activities should extend to the 5 ppb. MtBE contour line.)
3. Require a survey of all drinking water sources within a one-mile radius during the first six months. *
4. Require the submittal of quarterly groundwater monitoring reports.
5. Require timely initiation of remediation of the core portion of the groundwater plume. This should include the submittal of an Interim Remedial Action Plan within two months and its implementation within three months of its approval. *(Extension of these time frames may be granted based on site-specific factors.)
6. Require the initiation of soil remediation within two years. Soil remediation should continue until soils no longer act as a source of groundwater contamination.
7. Require the remediation of any remaining groundwater contamination. (Final remediation goals should be based on State Board Resolution No. 92-49.)
8. Report all monitoring and remedial activities on a quarterly basis. *

* Regulatory agency staff may waive these items, if appropriate.

Class III Sites

Class III sites are those groundwater cases with maximum MtBE concentrations below 500 parts per billion. These cases have usually unknown quantities of gasoline released into the subsurface soils with relatively minor groundwater impacts.

For Class III sites, a site characterization process should include:

1. Adequate vertical and lateral definition of the extent of soil contamination,
2. Identification of any groundwater impacts,
3. Definition of the lateral extent of groundwater contamination, if necessary
4. Submittal of quarterly groundwater monitoring sampling reports, if necessary
5. Adequate remediation of soil contamination, and

6. Regular reporting of data gathering and remedial activities.

The contaminated soils should be remediated to the point that they can no longer act as a source of groundwater contamination. This remediation should typically be in the form of limited-volume soil excavation or limited-term soil vapor extraction. Following remedial activities, confirmation borings and/or groundwater monitoring will serve to verify sufficient contaminant removal.

Class IV Sites

Class IV sites are those gasoline releases in which only soils have been confirmed to have been affected, or those located in areas which overlie groundwater which does not meet the definition of a source of drinking water.

For Class IV sites, the site characterization process should include:

1. Adequate vertical and lateral definition of the extent of soil contamination,
2. Identification of any groundwater impacts,
3. Definition of the lateral extent of groundwater contamination, if necessary,
4. Submittal of quarterly groundwater monitoring sampling reports, if necessary,
5. Adequate remediation of soil contamination, if necessary, and
6. Regular reporting of data gathering and remedial activities.

As with Class III sites, the contaminated soils at Class IV sites should be remediated to the point that they can no longer act as a potential source of groundwater contamination. However, the remedial actions at some Class IV sites may differ from those appropriate for Class III sites (i.e., prevention of groundwater impacts) in that the degree of soil cleanup required may be based on the actual or anticipated land use for protection of human health. Regulatory staff will determine the appropriate oversight and degree and pace of cleanup on a case-specific basis.